SEQUENCE LISTING

<110> The President and Fellows of Harvard College

<120> REGULATION OF BIOFILM FORMATION

<130> 00246/505WO3

<150> 60/102,870
<151> 1998-10-02

<150> 60/083,259
<151> 1998-04-27

<160> 49

<170> FastSEQ for Windows Version 3.0

<210> 1
<211> 1090
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(1090)
<223> n is a, t, c, or g.

<400> 1

gagcgcagna gaggaagngn gggagganga ggaaggagga gagnggaaga agggggggaag 60
gggaggggggg aagggagagn ggggagnngg gggnatnngg gannngggng gggngnggnn 120
ntgnttatna tnangctccg gccggacgaa gaaattcccg atgcattgct cgagcgcgta 180
ggcctgtctc gggacaaggt caaccacgta ttcagcaaag tgctcnaggc ggaantgctg 240
ctgcgcgaac tggcctcgca nttcagccac ggctgaatag gctcgcccgg tcatttgatc 300
tttcccacgc tctgcgtggg aatgcatccc gtgacgctct gcgtcacatc tcagaagcgg 360
aacgcggagc gtccctggcg acnttcccnc ncagggagcg tggggaaccn ancaaacntg 420
gtcccctcga ttntaaagtt cttccttaaa ancttcttnc gggcttccag ggtattttgg 480
tccancccccc ttgggaaccc anatccccca ggcggcccgg ggttgccccn tttgatcctg 540
gggattccga ctttgttcct tgnaaatccc cccttccatt gaaaccnccc angtttngcc 600
ttttgtttcc ctttgggccc ntnccaatcc gntgnggcaa aaacgcccat tanggggcng 660
gggcggtccc ccccccccncg nntgttactn aantncanaa cgccnnttgg gccanaaann 720
tcgnctngng nnnnnnnnnc gncntctttn ctnccccntcc nnnctntnnt cctcngtgta 780
tntccaantc ntnccnncgc ccntccngcc tccccactnc ctnngccctc cnnnccnncg 840
cgttncattn ctccnccntn ntccgcttnt ccccntttan cgtngccgtt ncccgcccgn 900
nncnnngtca tcnntgncgc tcttccnccc ncccctgtccn cccantgccn ngnnnctccg 960
aggtcgcngg tctcnccncc nccngnttcg tgcncnggcn cnngatcccg ttcncnccng 1020
nccntnatgc tgaccagtnn gngngngtng nnncctcccg tcngnacntg tntngngggg 1080
gggcccnccc 1090

<210> 2
<211> 277
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(277)
<223> n is a, t, c, or g.

<400> 2
ggnggggnng ggncttgtgt ataaatntca ggctctgaca tccaggccgc aggcggcctg 60
gtcccnatgg ttatcgacca ntccgcccgc ggcnaangtg cctatnanat ctactcncgt 120
ctgctcaang aacgcgtcat ctttctggtg ggcccggtaa aagactacat ggccnacctg 180
atctgtgcgc aactnttgtt ccttgaancc naaaacccgn acnaggatat ccatctctat 240
atcaacnccc cnggtactag ttcaacccgt gaaaaaa 277

<210> 3
<211> 819
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(819)
<223> n is a, t, c, or g.

<400> 3
gctngtgtct acgcntcagc aanaatgccg cccgcgacna caacncttaa tcngctgaaa 60
ntccattgga tgatgctcca cccgtccatc cnancctgga agccaggatt nctgcccgac 120
atnanggtnc gggtggcaac aatctcaccg naacctgnnc ctgtggtcac aancgaggtt 180
caggtcacca cggncgtccc ggcaccggtt gcccccnctgg tcaggccggg ccagggnncg 240
gtngccccag angtcnatcc tccctttgac cctnaancng acccgcncna tgcntggcna 300
ccnttgcntt tggcaatgga ccngggngga catnttnccg cccgctatcc agggcncnac 360
ccaanantac ngccccggcg tccctctann ntntactatt cnacgcgtgg gcananntgc 420
ccctngtngg cttnccttte tcttccccgn cncctntttt tccccnnntt tttttgncgc 480
gnccccnctct cnntcccctnc cttccncnnn ccntcgtctn nnnccctngt gggcctcncc 540
cctttntcct tccttccncn tttncttccg tggccctnct ctctgnttcc ncncngtngc 600
gtccggttan cccagcctcg ctctccnccg ctgnngcnct ctcntttctt gcttcntctt 660
ccctgtggcc ctntgcgatc ncncnanctt ctcctcgctn nggtcncanc cttcngtntc 720
cgcnngngnc gncnnncctnc tctngcnccn nnntcgtctt cgtnnncnng tnctnnnncn 780
ncagtcnngt gtngnnagnt tnncgnagtn tgnnatccc 819

<210> 4
<211> 832
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(832)
<223> n is a, t, c, or g.

<400> 4
gatggtatcg gtnactcggt caccgctggg gtggtgctcg gaacaggttc tcgaagttcc 60
cgccagtggc cttatcgatg ctgacttcaa ctttgcccgc gtctttgtag acgtcgtctt 120
ttggtgcgtc gacagtcacg gtgccggtcg tggcgcccgc agcgatgttg atcaccgcgc 180
cgttgctcag ggtcacagtg acaggcgagc ccgcggcgtt ggtcaaggtt gcggtgtaaa 240
cgatcgaacc gccttccgca acgctatcgg ttgcactcaa agtcaggccg gtagtgtcct 300
gaatgtctgt nanngtggtg tcngccgggg tggcgtccan gtccaatatt tcataattnc 360

naccntgggg tcctccannt tnannctcaa gttatcgccc ccccccaaag gctccttttng 420
cgtnacnaaa ttcaccgann ccganctggc nccnaaccgg aanggtgang gtctgggccg 480
ttcnaacang gttnnataac caaacggaac ntcgggtcac cggtttcntt taacngaagg 540
nggtgttnna accncggncc cnncttccgg ccaangngng aaattnncng gtgggnggaa 600
aanaggtcna ngttttnaan gggtttccng tnancntcnt nnnccccnan ggntttnttn 660
ntnanaaacc aaannтcncc ngaatttncc nccnggtngg nttttnncng nannnnggaa 720
nttnnngggt gggnnnnccn ntcctttgtt tnnaaaatna nncnttttng ggnccnnnnc 780
naaaagggnc annngnggnc cnnntgggnn ggnnnccnnn gggnccnaag nt 832

<210> 5
<211> 1054
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(1054)
<223> n is a, t, c, or g.

<400> 5
cncaanggcn cagagcacag gatatgcngc aatctcatgg acaaacggcg ccagcccnat 60
ggaggccacc gacnccacat ccgtcgcgcc ggtcgcttgc aggcncgcca acgcancctc 120
aaggttctgc gccanttgca ncnctncctc gcncaccanc cnnagttgcc agcnccncaa 180
actccccacc ncnaanncnc ntnacnaaat nntgggtttc cgnataccgc ccncactcac 240
gcaccaattg ctcacccncg gcctgaacna actggtcggt ncnctncccg ccccatccnc 300
tggttnaaac nggccnattc cttnaccccc agcaacancn aataacccgg acctggccan 360
cnccgggtng ctcacccggg cattaaactg cattttcaaa atatnnccgg ttggccacgc 420
ccgtnaggtt gtcctgntag gatccnaccc ccantttcnc tntgcccctn ggnctgntcn 480
nggaanngnn ccntgagctt tctcgaccat ctgggtttct tnctcntgcn cccactcncg 540
nnncaagttt taaggtnttn nctccgggna atcctctnng gcnannnnctt naactgnaaa 600
cttccnccga acngggncct aanantagnc ctatnnгggg nnacnngcgt tgnccaaccn 660
aactnttttt ttttcccagc cgcggggctn ttcaagtcnt tgaacgnaac tcctcnngtc 720
nttccacang gnctcccccc tantntntaa ccgcgtntcn tctatnttgg gngtccccgn 780
ntncatacat gncngagtan aagaagctcn ancctcccna nnnggntctc cgccccccaa 840
tttntccccc ctctcccttt nancntctaa atatattctt tnntgggnnt naanaagggg 900
ggcgcanaaa nacctntctc cggggggggt tgtgggncct nnanaaaccc ccctttctnt 960
tntnnncccc cctccgnggg ggctccnccc tccctntttg ttttccccnc ctannaatcc 1020
ctactcncng gnctagttga aaaaacanna acgc 1054

<210> 6
<211> 880
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(880)
<223> n is a, t, c, or g.

<400> 6
ncnnacgnnt ngnaagtgat caggccnatt aaacnnntga cnaaannaga acangnnggt 60
ctgttactac tcttcaagac caacccaagn cgaccgtgna tagcgngncc tntacgcagc 120
atcngttccn catttagatt nntatccatc cntaagtttc nccgggtcag aacgntnctt 180
gacgtacaac ccatanngcg gggtannggg nnattttnng ctacctcnca tgttttggaa 240
gnccnantnc ccnttaatng gnagcnncan ncangcncnn ggggattatt acnactcnac 300

ccntgganaa cnttgccact acngcnggnc ccccgcngng tccnggnctc ccctgcccac 360
ttcccttgtc tcccgncctc tntnccccct tttcncgtcn ncttctggtg tncgnttccc 420
ctccccccng tcctcnttca ncnnctngcg tctngggcac ctngncgnnc tcttccctnc 480
tggcccctct nnccccentt cgttntancc cctctctcna cntncttcat cccgtccctn 540
ttcttnctct ccnctcncen ccctntccta ntcctntcgt cccnctncgn tcntcgtctn 600
cctncnccnc ttntcgactt cnncntgttg ncccncccgc ngngncttct ctngtcttct 660
cccgtcngcn gctcagnncc cntccttccn ttnctnctnn ctgtccgncn gcgnncctgt 720
ncctncgncc cctagnnngg ncgcgcctcn gcnncctcgt cccnngntnt nntctttctg 780
cnccgtgctc nntnttcntn tntcnnctcg cccatccnct ncctctntnn nncgtngntt 840
ccncttctag gnccnnattc cnannncngg ccnttncccc 880

<210> 7
<211> 779
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(779)
<223> n is a, t, c, or g.

<400> 7
ncaanncaga tcctgnaaaa cgggaaaggt tccnttcagg tacgctactt gtgtataaaa 60
gtcagggccc aaacgcccca ggtgcaacaa ctggtcnaag gctacntggc gggttacaac 120
cgtgcgctgg tcnaacgcaa ggccaaaggc ctgcccnaac aatgtgccag cnaatgggta 180
cggccgatca cggcgctgga cctggtcaag ttgacccgcc ggctgttggt ggaagggggc 240
gtcggccagt tcgccnangc cctggccggc gcgcaaccgc cccaggcnac cgcactcgcg 300
ggcaccccgg tcaccggttt cgcggccgcc gcaacccggc agcagcnttt tgccctgaaa 360
cgcggcaaca atgcnttggg ccatcggcan cnaacgctcg ttcaatgggc cgttnggaat 420
ntttgcttgg caaacccccc atttttcccg ttgggttagg cggcattcct tttctnacca 480
naaagcacct gaaccattcc ccggcaanct tggaaattct tgggccccng ngcctgccaa 540
ttttgccnaa aaatcaanat cggtttcaac canccncctt gcctggaacc aaaccgtcaa 600
aaactccaaa aaaattcccc cttnccnctt gcaatcnntc naagaaccaa ccctttttтn 660
ccaaggnatt ttttttccna naaacnncaa angtntttnt naattttacn acttaaggcc 720
anttnnaaag tncccaattt tttanngtcc aatttgnccc nattttaaag gctccggtt 779

<210> 8
<211> 848
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(848)
<223> n is a, t, c, or g.

<400> 8
gccnnnncnc nattatncaa gntctaagtg ttnnaccana tnccaaggac ataatgactt 60
nccttttatta antgtccgga ccatnccata tncaaccgtg canaccgtna acttnaccca 120
ncatgnctcc gcntgtcgta tttatanncc ccataagctt cncccgtcag aacgttncaa 180
taggtacant natactgcnc ggcncatggc attttggctt tctttatgtt nggnagttcn 240
aacagccttt ttatggagcg tccacagcta taggggggaaa ntnctattca acnctggcna 300
aantttgaaa aactnaganc ttcnnnggtn tataggggta tcccntgacc aaannccnct 360
aattccnacn ctttgntccc acttcctccc tngcgcgnct ttaccnngng ccccgtccct 420
tccccncngn ncntnggnca cnggggggaaa ngnnntcncc ccgtggtttt ctcccngtcn 480

tngnnnnncc tcgtgnntcc cggnnccttn ccccccngtt cggaactntt ctcccctncn 540
cccncgcgng tgcgtctnnn tnncccnngn tncncnggnt tncncngccn ccntttcctc 600
ccccccccce ttanccngga nccctctccc tncgcntggc cngccccccn ggnccctccc 660
ctntnccctc ggngncncnc gncgcnctcc ttnncnttcg cctcctccnn ccntcnnctc 720
cnctcntncc nntcccnncc ctcntnnntc ccccntgccc nnnncnccgg ccnttcgntc 780
ctcnnnnnnn tncctgngcc cgcgtgcncn gtngcgnccc gctntcctgc ctgtcncccc 840
ccctnccc 848

<210> 9
<211> 533
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(533)
<223> n is a, t, c, or g.

<400> 9
tatttgtgta taagntcagc gccagcagtg accgatgtca ccgataccat cgacaccagc 60
accgtttcgc tcacagcgac ttcgacggtg gccgaaggtg ggactgtcgt ttacaccgcc 120
tcggttaacg cacccgtgac cgacgctccg ttggttatca ccctgttcca aacggccana 180
ccatcnccat tccggttggn gccagcancn gcaccgtgaa cttcgtgaca ccaaacgacg 240
ccctcgcggg cggcgataac ctgagcgtga agattgatga cgccaagggt ggcaattacn 300
aaaaactgga catcgacgcc accccggcgg acaccaccgt taccgatntg caggacacta 360
ccggcctgac cttgantgca accgatagcg ttgctgaang cggntcgatc gtttacaccg 420
caacattgac caacgccncc ggntcgcctg tcnctgtnac cctgaacaac ngngcggtga 480
tcaacatccc tgcgggngtt tccccccccg tnctantcta cacgngngaa aaa 533

<210> 10
<211> 591
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(591)
<223> n is a, t, c, or g.

<400> 10
tgattgtgta taagatcagc cagcaaggcg ccgtcgtcgg gttggtaaag ccccaccagc 60
aacttggcca gggaactctt gcccgagccg ctgcggccaa tgatgccnat tttctcgccc 120
ggcttganca ccaggttnat attctacacc tngggnttct gctggttcgg anaaatnaaa 180
nttcaactna nngnattcca acggcccctt ccagaacttt cnggtcangg ggngctcntc 240
caaattgcgc tcttggggca gctccntcat ctggtcgana ganatcttgg tcacccccce 300
ctgttggtat cgggtcntca ngcccnacaa cnaaaccaac nggctgaggg cgcgaccgct 360
gaacatntnt cangcgacca ncccacccnt gctcangcna ccggcgatna tcaagtntac 420
nccnaaaana anatgaccac cccngccagt tnctggatca acaaagtgat gttctttgcc 480
nggccggana acatcttcac ccccanttct aagcggctga aggtgccgat agtctgttcc 540
cnctggtatt ggcgtnccnc ccccntact antcaacncn tggnaaaaaa a 591

<210> 11
<211> 1249
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(1249)
<223> n is a, t, c, or g.

<400> 11
ctgggtgtat aagatcaggg ccantngtgt cctggagtgt ctgtnacagt ggtttcggca 60
ngcttgccct cnanatncan tttttcgtaa ttgccaccct atggcctnct ccnaatttga 120
ancacnagnn acctncccan tgncaagggc ttcttcngcn tcnngaaatt canccnacnn 180
naaatngggc caaccctgan tggttaccgt cntgccgcnc ccnctcnggn catttctctg 240
ccnaagcntc ccggtncctn gnttgccttc taacccaagc gncngntntn nancnnncctt 300
gtttcncccc tncngnccna cgggtggaan ggttttnccc ccntaggggc ctcnnttntt 360
tctaaancgc ttttccagaa aaaggcctgc ccggtntacn ccttcttann tntcgtcgcg 420
tccnagngct tatcnctctc tnnccccttc ggatactnct ctgtaagttt ccctaaaatc 480
nnctggntng gnttctnncn anaaagaana tctntggggg ctttntntnt tatatcctct 540
cntattgtnc tttncnntan cntctntccn ngannctcat tcccganacc ctctnnnnnc 600
cgccttncnc tctcntatan tttctnagtt gaaccgctcn tcccnctnca ctnttattnn 660
ntnngcgggn cgcncncttt gtccctcntt aaccctgggg ntngcgagcn tacnggctcn 720
ctccctaatn ctctgggcgg tnnnggggcg nacgtcctcg ccttcgttcn naaatnnttc 780
ntaanttcca acntcgngcn gccccgctcc ggnnnnnnca atnttntctc ccccctattc 840
tngctacnca gcgngtgatn atcccnttct cannagcctn ttcngggtat aacngngnag 900
ngannctctc tctttagtnc cnnaanccna tctctnctcc tcttcttcng gtcgcgctnc 960
tanancnctg gtcagttnnn tcctcnatgn nncnnaggnt cccnnttnct cnctcncttc 1020
ttgnnnactc ccngtntgtc cnggantggn tcttccgcct cggnancnnt gctcctntnt 1080
tcncnanncg aanantctcc ttnctaacac nccttcgccn aanacntttt nactctnccc 1140
tcntccttcn ctnnctcgtc tnattntnan ttncntncct anncngtgac tcgttagcnc 1200
tccgntcttt ccnantcttc gccccctct ccncnctcna nnctatccc 1249

<210> 12
<211> 373
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(373)
<223> n is a, t, c, or g.

<400> 12
tnattgtgta taagntcagg actagagntc ctctcttagt nacggttcgc agcgttttgc 60
accgcatcgt ccantgcgtn ccccaccccg tactagtcga cacgtggana aactcgcccg 120
gagtcgacnc gtgggtanta gtcgaagcgt ggnganggnt cncgntatna ggcntaanan 180
ctgcatcacg aaagcngggg gaaggttctc naaaanttcn ccnatgaggg agaacacgga 240
aanccccttta ccncaggggc ggcccngaaa tctggcaacn gancggnngg agaatcnncc 300
atttcgtcag ctccatgggc accaccggga acatcatggg cgtcnnntnc cngtactant 360
cgaccgtggc caa 373

<210> 13
<211> 683
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(683)

<223> n is a, t, c, or g.

<400> 13

tgactgtgtg ttataagntc agncgcacnt ggnagtccnc ntntggttgg tangatccgc 60
ancnattaag ctggccnngg gaaantcngg ttcaacccgn tgcngncaat ganncnntat 120
ttcactcncc cggcgtncac ncctnngtan tantcgaccc ntggncanta ntantctaca 180
nntggtcaaa acntttcgan nnngtaggng ncgccctntn tanangtnan cttcgtnacg 240
ggggaggaaa angctccccg gnggccannn gccgagccta aaaaangagg cangtanggg 300
tgngaaaaaa naatanctng atangacncc acccnntttg acgccaatta accgangtac 360
angacccngn cnaactcatt ttnagtgtnc gcgacagaaa ttttnanggn cgcnccangn 420
gaanggntct cnanggtttn gnaaannnaa acnaggccct ccnntaaatg gtggacccgc 480
ggnnaanntt nnccncgant ggggttttga aattactttt caacaatctt caaaacntcc 540
gggtcnancc aggaggggnc aaaaaaaaaa tnttttccgn gtngccnnaa aaatatccna 600
aattttntcn cccccccccc nccnnaaaag aagggnnggg gggaagggga aaaaggggag 660
aangaggggg gggaaggggg ggg 683

<210> 14
<211> 672
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(672)
<223> n is a, t, c, or g.

<400> 14

gtgcttgtgt ataagntcag nccctggcct gngcgncnac aactccggtn nccgtctaca 60
ntttagcnaa ggatcggtca ttgcctngtc tnctggntan actnccggga cnatccacct 120
caatactccn nccattnacg tctatggtaa ccnggaggtc ggtcancagn ncnattaccg 180
gtnctaccng tggaaacttc gaaaatctng tggcnaacac gggacctgcg gtccccncca 240
nttccgattc nggnganacn ncatggntgt cncnnacngg nngcnacncc attcctgnan 300
gggngccaan ttcctttcnc ntcaanccgt nggnaacggg cccnaatncc gtnaacgtta 360
ccnnnganaa atggtcngtt ttccattccc ccgggggnan aaaccgggac ngaagatttc 420
aanacccgcg cntntnattn taccnngggg nnngcgggtc gnccccncn nnacnngtga 480
naanggggg ctnttcaaan ttcntngtgt tnancacnac cctggggttt natantantt 540
ncanaattnc gggnggaana ccaccggggc ttnannnctt nnaacnggnc nnncnaccnn 600
ctttccnnnn ngggggggng ttccnncnnc ccccentttnn nttnntttnn aaannttttt 660
gggggaaaaa aa 672

<210> 15
<211> 1676
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(1676)
<223> n is a, t, c, or g.

<400> 15

tgcttgtgta taagatcagg gcccgncgcc nccnnantta ngtctgggtc aacgacacnn 60
catnggtgcn gtggnanctc antttacnag gcncttaaaa ngcatnattg ttatncagtn 120
ngncgaggtn gntcctcccn tanccgaagn natntgnnna cttggaanga tttnancntt 180
ttccantcgg tngntaccag nngtgantcn tcantttctg acacccnctg gtnncnntcc 240

tgttcacncc tanannngac cnctctctcc gntgngggcc tggngcntaa tatnntaccg 300
gctttnnant gctgtcagta tnantctcgn nagcngnaaa ntcnctctnc anncggtgtn 360
tntngtctcn cncttctcct nctcntacac tcactnactn tntnctgnna atcnntctnn 420
ctgtantatc acggncancn cgttctntgt ggggctcnct tganaggctc cccctnacct 480
ctctannnac ngtgtcgggt atnncnctat aanagtcttg tgcatgtntc acagtnacat 540
cgtcgccnnn cncgngtagc tctgcatcnt cgccctttтn tttctnttct ctcngcaaan 600
atcttnntnt ctctcnntcn atcattattc ncangcgnng gggtctccnt ccccctcnnn 660
ncntcngttc nanacangtc ntntttagct atgtcttatg tncncctntc anttttnctn 720
cncttcncac ncttcagann ggctnngnct gacctctata gtcgntcntc tcctccctct 780
nctnntctct cngcnataac gcncntncnc ttctggnctc tcnngctctc tnntnntata 840
tccnncgccn nttctctcta tctctccgnt ntgtgctcnt caattgtncn ctctctcgtn 900
cnnctgtcnn ntctancgtn ttcttgactt nannaatacn tacctctctt ngcctctctn 960
cntntnctct cnccgcatct ctnngaccgc tncctctgcn cngcgcnatc tcttctttnc 1020
gttctccnnt tctcgcgnct ctctnngtac tngcttttcc cnctacctnt ctcttgctcc 1080
ttcctcgcnt cntctncctc tctcttctct ntctangtcn ncncgnccat nggctttctc 1140
tcgctncntn tcnctcttct ntctntnccg tctcgtctng atcnntctct catcatntnc 1200
tntnttntca tcangctntn tgncactctc cnatctgtnt ctctntctta ntnntccntc 1260
cttcctnttc tcttanctcn cgtnnatnnc nttctctgat ntcctcnagt atntctatgt 1320
acgctnncnt tnatcgngnn cctntctcta tcancatcat nctagctnnc ttcctatngt 1380
cctgctctca ctntttctgc cnanatatnn atcnctnctc tntatcttcn tanattnntn 1440
cctntnaatg tttnanaatg ctctactcna nctctctntn tcttnnnctc cagntcactc 1500
tctananntg cctnncgtta tacgntcttn tncgctttan tgcgtntnct atcantnncg 1560
ctcttttntt ctcntctcnc cntgtncttn ncacactntc ttcatctctt ctcnnatatn 1620
natgtcnntc tatnnccnct tctatgctnt cncctntcna nccacantnt nntctc 1676

<210> 16
<211> 721
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(721)
<223> n is a, t, c, or g.

<400> 16
tncttgtgta taagatcagg cctatngccg nctgnggntt ntctgggtgc ncgacgcgcc 60
attcgaaaaa ancagctccg nnaccngttc caantacacn nngttgtncn nccgnagttc 120
cagcttcngc ctcgccnacg tnnacaattc ctncnaaacc ctgggtgtgn tnttccnnna 180
gctnatgtan ganngtcnat nggnctgnnn gnactgtcnt accnagncnc angtnggcac 240
caaccngagc ntcattcncg cnnacnncga accccgngng natcgcttct ntccnaacnc 300
cnncaantcc aacnccatng gttgtgttgn cnacgacnng ngcgaaaacn ncgcncacnn 360
ngnccnagtc aagttcccgc atacccacag cnggtcnggg ggtntcnccc cctntcntgt 420
tccaaacatn nccatanaan nnnnggtntg ctgggggaat ccaanccntc nnctgnggtt 480
cgatcnaaac aanatanggg tcaanggncn gccacttgcn tnatnaattt cnncagtgcc 540
cntnnctnnc tgatnngcna agccnncnnn gggttggngg gggnnnttnc ccnnntatna 600
antanaaacg gcngntccnt tnncnnccan gggtgnttgn ngntttnnaa aacnnctttt 660
nnnnaaanan ccccccncct ntttnccnng gannannatc cnnaaannnn gttccnnccc 720
c 721

<210> 17
<211> 452
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(452)
<223> n is a, t, c, or g.

<400> 17
atnnngnnnn tncttgtgta taagntcagg gcnccncctn tcnnaacttn gtctgggtcg 60
ngctacacnn cannggnnac tggcagctcg gtnaccgcta cctnanaacg cttcantgtt 120
cctcagcngg tccacgtcca gccttgagcc acatgtnaaa anncngccna caanccnngg 180
ngtnaannтc cacgnnntgc ncgacgantg ccaatnnaan nttctcnacn gtttcacctg 240
gaangacctt gccganaccn anacnntcac caanggtgaa nncaactccc ggnagatncg 300
ctncacnccn gaccccaacg aatcctncgc cgnnggtttt nttagcanca tcgncgncan 360
caaccangnc canttcnccc cgntntcatt ccnnccnanc gacggnnnnt ctgggcgtcn 420
ccccccccgt actantctac ncntnncaaa aa 452

<210> 18
<211> 442
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(422)
<223> n is a, t, c, or g.

<400> 18
tncttgtgta taagntcagg ntctnagatg agctcggtag ttcangagnt tttctgcgac 60
cgcgnnnccg acgnctgnaa tcgntggcna ggtnngcnta nacannnnaa agtanncccc 120
tcgaancgnt cnntgacctc ctgntccaaa tngtcacgng cattggncga cgcnngcnca 180
cccnncactt cgctcgacnt cccaaaancn gcctgggccn ngcncgncng gattnngccc 240
gacatcnnct nancaaantn ccccnccgcn tactngncca nccttgacca nnttttgcnc 300
tcctntcctt actgggtcng cttcgntccc ggnttgctna ccannatggt ccnaancctg 360
ctgtcctnca ctctcaaatn cgccccggc caaccntgct gatcgncttc nncncccnag 420
tnctattcaa cccctgccca aa 442

<210> 19
<211> 538
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(538)
<223> n is a, t, c, or g.

<400> 19
ctttgttgta taagnatcag acactagagc ttgccccttc tncancnctt cnatggacag 60
cggctttcgg gccgtcgagc aacgatctgt ccacagtnna ncaccannag gcgntccacc 120
atcaanagaa aggannсncg gtncntnacc acnnacacan gtcttgttat cnaccacggc 180
agccaagcgn tgtttcaaac gttcttcagc ngtgttgtcc atggatctgg ttggttcgtc 240
caanaacaag ataggcgtgt tnancnccnt ncnactngac acgtggaaat tntngctcta 300
accncccgac angttctgtc nncnctcncc naatnnnaat tcataacctt ncngatgccn 360
gcgggcaaat tcatncncnc ccgccanttc acggnctgga acacanttca actncnacgt 420
ttcnggcgcc naaaantctt gttgtcnccc aggntttnnn nancancnng atnttnttgg 480
ggnnccttnc cnaanttntt nnncnnctcc cntnannttg aannтngnng gatgttna 538

<210> 20
<211> 218
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(218)
<223> n is a, t, c, or g.

<400> 20
tnatttgtgt ataagttcag gttgctngnt gnacgccatc ccggccaagg gttgccggcg 60
tcacccacat ngtactagtc nncgcgtggc cnaaacggtg angtctncta attgatgctt 120
gccaacgntt naaaaaaaag tatngacagg gtnttaacca tcagnttntn ccnaaangta 180
ctagtctacc cgtggccana naantnnann nntggnca 218

<210> 21
<211> 642
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(642)
<223> n is a, t, c, or g.

<400> 21
tnctttgtgt ataagntcag gccccggggt ancgncagta ngtntgncga ncggctcctg 60
caagctgncg gcgnanatcc ngcgctncct cttnntgcnt ctgaaatgca ttnccctcn 120
atgagtcggc tgtcttcang gttnggntgg ttncaacatc catcancttg ntctccnctg 180
ttaccccngc ngtnnncctgc cgccctctca gaccnggatn cccgtncanc acccctagt 240
tctaanaacg taccangaan aangaacacc cgctcgcggg tgggcctact tcacctatcc 300
tgcccggctg acgccgttgg atacaccaag gaaagtctac acnaaccctt tggcaaaatc 360
ctgtntatcg tgcgaaaaan gatggatata ccgaaaaaat cgctatantg accccnantc 420
anggttnttg caacggaaaa ncnctncttc cctgctgttt tgtggaatat ctaccgactg 480
ganacaggcc aatgcatgaa attactgaac tgaagggaca agcaaaaaac catccaanna 540
actncaccaa cnanctggcc gagtnggttt naatccccgc gccggccaaa aaacgccngc 600
attaannaan gcnggttgtt tctnttnctc gnnnaaanaa aa 642

<210> 22
<211> 583
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(583)
<223> n is a, t, c, or g.

<400> 22
tattgtgtat aagatcagnc cagcngtggt cntacagntg ggacaggcgg cgtcgcaagc 60
ttcccctcga gtgntgntcc agnnatancg agncntgngt gttataaaca aancacggnn 120
atcgtataac nccgttcgtg acgncgtatc gccanatctn naatnccgna aacgggtnga 180
aatccgtaat ccaagtgtta tcntgcncgg gatgttctag agcaactcca tcatctntac 240
aancttgttc gancttgtca tggcacctcc actgagacaa cggtgtnctc aatagtcanc 300

acnccccctnn cccccnggga gganatntnt cnctggnncc acncnancan catctttaac 360
gnatatttct tntttatcag cccnnttggt tacccnntgc gtcattgggt ggntgcagcg 420
acaacncccg gagaaancna tttncttggn nggctcntcn atcatcngca ccncccccca 480
aattganaag gtcgccccnc nccnngagan acnntanccc angtcggccn tcnncangtg 540
cgtggcgtcc cccncccgtn ctantcnacc cttnccagnc caa 583

<210> 23
<211> 360
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(360)
<223> n is a, t, c, or g.

<400> 23
tctttaanta gnaccgacga ntcctcctan cacccctaac cagtcnacgg ctngtggcga 60
ctggatatng acactngacc aggtcggggc ntcncccccac nnntnctatt caacgcttgg 120
ccaaacacgt ggtcanatct ctcnccagtg cccctcntan cnttctccga tacacttntc 180
ttcttccaat atccccccgct aatcccctct catcngtgaa nnggccccgc tccattaaaa 240
agcatngngc nnacaaacaa ccngagatcn ttcnnnttnn cannectccc gntccctcaa 300
atttcgnnag gggnccggtt gcgacccnaa accgcntccn ngnggnaaat ttcttncntt 360

<210> 24
<211> 494
<212> DNA
<213> Psuedomonas fluorescens

<220>
<221> variation
<222> (1)...(494)
<223> n is a, t, c, or g.

<400> 24
tncttgtgta taagntcagg cgcaggcgng accgcactan ctatgtgang ngctctcngt 60
cggngnnnca ggcnatgccc gtcattgtcc atntgcngac naccctacta ctcttntgcn 120
tgancatgac tgccgggccg anaagttgcg cattgtcacc taaccctggg cgcctgtatg 180
tctncnaaaa naactgcaag atgctgggcc tggactacna aaccacggcc atcgtgttca 240
agcncctggg tntcgacgtg gaatggcagt tcctgccgtg gaancgctgc ctggtgatgc 300
tggancaggg gttggcgtac cgnncccngt acnnttnnac ccntgnnnaa ancnatnccn 360
tgcngcttta ccccnncnaa ncnctntcng acntggaatt tgtgatnttc tacnccnatg 420
cccngcccca tccntttcgc ncncncnata anctgggngn ccccncccccc gtnntantcn 480
accntggnna anaa 494

<210> 25
<211> 23
<212> DNA
<213> Escherichia coli

<400> 25
gaacgttacc atgttaggag gtc 23

<210> 26
<211> 35

<212> DNA
<213> Artificial Sequence

<220>
<221> variation
<222> (1)...(35)
<223> n is a, t, c, or g.

<223> Random sequence

<400> 26
ggccacgcgt cgactagtac nnnnnnnnnn gatat 35

<210> 27
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Random sequence

<400> 27
ggccacgcgt cgactagtac 20

<210> 28
<211> 24
<212> DNA
<213> Escherichia coli

<400> 28
cgggaaaggt tccgttcagg acgc 24

<210> 29
<211> 35
<212> DNA
<213> Escherichia coli

<220>
<221> variation
<222> (1)...(35)
<223> n is a, t, c, or g.

<400> 29
ggccacgcgt cgactagtac nnnnnnnnnn acgcc 35

<210> 30
<211> 17
<212> DNA
<213> Escherichia coli

<400> 30
caggctctcc cgtggag 17

<210> 31
<211> 17

<212> DNA
<213> Escherichia coli

<400> 31
ctgcctccca gagcctg 17

<210> 32
<211> 23
<212> DNA
<213> Escherichia coli

<400> 32
gcttccttta gcagcccttg cgc 23

<210> 33
<211> 24
<212> DNA
<213> Escherichia coli

<400> 33
cttccatgtg acctcctaac atgg 24

<210> 34
<211> 595
<212> PRT
<213> Escherichia coli

<400> 34

```
Met Ala Gln Val Ile Asn Thr Asn Ser Leu Ser Leu Ile Thr Gln Asn
 1               5                  10                  15
Asn Ile Asn Lys Asn Gln Ser Ala Leu Ser Ser Ser Ile Glu Arg Leu
            20                  25                  30
Ser Ser Gly Leu Arg Ile Asn Ser Ala Lys Asp Asp Ala Ala Gly Gln
        35                  40                  45
Ala Ile Ala Asn Arg Phe Thr Ser Asn Ile Lys Gly Leu Thr Gln Ala
    50                  55                  60
Ala Arg Asn Ala Asn Asp Gly Ile Ser Val Ala Gln Thr Thr Glu Gly
65                  70                  75                  80
Ala Leu Ser Glu Ile Asn Asn Asn Leu Gln Arg Ile Arg Glu Leu Thr
                85                  90                  95
Val Gln Ala Ser Thr Gly Thr Asn Ser Asp Ser Asp Leu Asp Ser Ile
            100                 105                 110
Gln Asp Glu Ile Lys Ser Arg Leu Asp Glu Ile Asp Arg Val Ser Gly
        115                 120                 125
Gln Thr Gln Phe Asn Gly Val Asn Val Leu Ala Lys Asp Gly Ser Met
    130                 135                 140
Lys Ile Gln Val Gly Ala Asn Asp Gly Gln Thr Ile Thr Ile Asp Leu
145                 150                 155                 160
Lys Lys Ile Asp Ser Asp Thr Leu Gly Leu Asn Gly Phe Asn Val Asn
                165                 170                 175
Gly Ser Gly Thr Ile Ala Asn Lys Ala Ala Thr Ile Ser Asp Leu Thr
            180                 185                 190
Ala Ala Lys Met Asp Ala Ala Thr Asn Thr Ile Thr Thr Thr Asn Asn
        195                 200                 205
Ala Leu Thr Ala Ser Lys Ala Leu Asp Gln Leu Lys Asp Gly Asp Thr
```

```
    210                 215                 220
Val Thr Ile Lys Ala Asp Ala Ala Gln Thr Ala Thr Val Tyr Thr Tyr
225                 230                 235                 240
Asn Ala Ser Ala Gly Asn Phe Ser Phe Ser Asn Val Ser Asn Asn Thr
                245                 250                 255
Ser Ala Lys Ala Gly Asp Val Ala Ala Ser Leu Leu Pro Pro Ala Gly
            260                 265                 270
Gln Thr Ala Ser Gly Val Tyr Lys Ala Ala Ser Gly Glu Val Asn Phe
        275                 280                 285
Asp Val Asp Ala Asn Gly Lys Ile Thr Ile Gly Gly Gln Glu Ala Tyr
    290                 295                 300
Leu Thr Ser Asp Gly Asn Leu Thr Thr Asn Asp Ala Gly Gly Ala Thr
305                 310                 315                 320
Ala Ala Thr Leu Asp Gly Leu Phe Lys Lys Ala Gly Asp Gly Gln Ser
                325                 330                 335
Ile Gly Phe Asn Lys Thr Ala Ser Val Thr Met Gly Gly Thr Thr Tyr
            340                 345                 350
Asn Phe Lys Thr Gly Ala Asp Ala Gly Ala Ala Thr Ala Asn Ala Gly
        355                 360                 365
Val Ser Phe Thr Asp Thr Ala Ser Lys Glu Thr Val Leu Asn Lys Val
    370                 375                 380
Ala Thr Ala Lys Gln Gly Thr Ala Val Ala Ala Asn Gly Asp Thr Ser
385                 390                 395                 400
Ala Thr Ile Thr Tyr Lys Ser Gly Val Gln Thr Tyr Gln Ala Val Phe
                405                 410                 415
Ala Ala Gly Asp Gly Thr Ala Ser Ala Lys Tyr Ala Asp Asn Thr Asp
            420                 425                 430
Val Ser Asn Ala Thr Ala Thr Tyr Thr Asp Ala Asp Gly Glu Met Thr
        435                 440                 445
Thr Ile Gly Ser Tyr Thr Thr Lys Tyr Ser Ile Asp Ala Asn Asn Gly
    450                 455                 460
Lys Val Thr Val Asp Ser Gly Thr Gly Ser Gly Lys Tyr Ala Pro Lys
465                 470                 475                 480
Val Gly Ala Glu Val Tyr Val Ser Ala Asn Gly Thr Leu Thr Thr Asp
                485                 490                 495
Ala Thr Ser Glu Gly Thr Val Thr Lys Asp Pro Leu Lys Ala Leu Asp
            500                 505                 510
Glu Ala Ile Ser Ser Ile Asp Lys Phe Arg Ser Ser Leu Gly Ala Ile
        515                 520                 525
Gln Asn Arg Leu Asp Ser Ala Val Thr Asn Leu Asn Asn Thr Thr Thr
    530                 535                 540
Asn Leu Ser Glu Ala Gln Ser Arg Ile Gln Asp Ala Asp Tyr Ala Thr
545                 550                 555                 560
Glu Val Ser Asn Met Ser Lys Ala Gln Ile Ile Gln Gln Ala Gly Asn
                565                 570                 575
Ser Val Leu Ala Lys Ala Asn Gln Val Pro Gln Gln Val Leu Ser Leu
            580                 585                 590
Leu Gln Gly
        595
```

<210> 35
<211> 119
<212> PRT
<213> Escherichia coli

<400> 35

```
Met Gly Ile Met His Thr Ser Glu Leu Leu Lys His Ile Tyr Asp Ile
 1               5                  10                  15
Asn Leu Ser Tyr Leu Leu Leu Ala Gln Arg Leu Ile Val Gln Asp Lys
            20                  25                  30
Ala Ser Ala Met Phe Arg Leu Gly Ile Asn Glu Glu Met Ala Thr Thr
        35                  40                  45
Leu Ala Ala Leu Thr Leu Pro Gln Met Val Lys Leu Ala Glu Thr Asn
    50                  55                  60
Gln Leu Val Cys His Phe Arg Phe Asp Ser His Gln Thr Ile Thr Gln
65                  70                  75                  80
Leu Thr Gln Asp Ser Arg Val Asp Asp Leu Gln Gln Ile His Thr Gly
                85                  90                  95
Ile Met Leu Ser Thr Arg Leu Leu Asn Asp Val Asn Gln Pro Glu Glu
            100                 105                 110
Ala Leu Arg Lys Lys Arg Ala
        115
```

<210> 36
<211> 295
<212> PRT
<213> Escherichia coli

<400> 36

```
Met Leu Ile Leu Leu Gly Tyr Leu Val Val Leu Gly Thr Val Phe Gly
 1               5                  10                  15
Gly Tyr Leu Met Thr Gly Gly Ser Leu Gly Ala Leu Tyr Gln Pro Ala
            20                  25                  30
Glu Leu Val Ile Ile Ala Gly Ala Gly Ile Gly Ser Phe Ile Val Gly
        35                  40                  45
Asn Asn Gly Lys Ala Ile Lys Gly Thr Leu Lys Ala Leu Pro Leu Leu
    50                  55                  60
Phe Arg Arg Ser Lys Tyr Thr Lys Ala Met Tyr Met Asp Leu Leu Ala
65                  70                  75                  80
Leu Leu Tyr Arg Leu Met Ala Lys Ser Arg Gln Met Gly Met Phe Ser
                85                  90                  95
Leu Glu Arg Asp Ile Glu Asn Pro Arg Glu Ser Glu Ile Phe Ala Ser
            100                 105                 110
Tyr Pro Arg Ile Leu Ala Asp Ser Val Met Leu Asp Phe Ile Val Asp
        115                 120                 125
Tyr Leu Arg Leu Ile Ile Ser Gly His Met Asn Thr Phe Glu Ile Glu
    130                 135                 140
Ala Leu Met Asp Glu Glu Ile Glu Thr His Glu Ser Glu Ala Glu Val
145                 150                 155                 160
Pro Ala Asn Ser Leu Ala Leu Val Gly Asp Ser Leu Pro Ala Phe Gly
                165                 170                 175
Ile Val Ala Ala Val Met Gly Val Val His Ala Leu Gly Ser Ala Asp
            180                 185                 190
Arg Pro Ala Ala Glu Leu Gly Ala Leu Ile Ala His Ala Met Val Gly
        195                 200                 205
Thr Phe Leu Gly Ile Leu Leu Ala Tyr Gly Phe Ile Ser Pro Leu Ala
    210                 215                 220
Thr Val Leu Arg Gln Lys Ser Ala Glu Thr Ser Lys Met Met Gln Cys
225                 230                 235                 240
Val Lys Val Thr Leu Leu Ser Asn Leu Asn Gly Tyr Ala Pro Pro Ile
```

```
                245                 250                 255
Ala Val Glu Phe Gly Arg Lys Thr Leu Tyr Ser Ser Glu Arg Pro Ser
            260                 265                 270
Phe Ile Glu Leu Glu Glu His Val Arg Ala Val Lys Asn Pro Gln Gln
        275                 280                 285
Gln Thr Thr Thr Glu Glu Ala
    290                 295

      <210> 37
      <211> 308
      <212> PRT
      <213> Escherichia coli

      <400> 37
Met Lys Asn Gln Ala His Pro Ile Ile Val Val Lys Arg Arg Lys Ala
 1               5                  10                  15
Lys Ser His Gly Ala Ala His Gly Ser Trp Lys Ile Ala Tyr Ala Asp
            20                  25                  30
Phe Met Thr Ala Met Met Ala Phe Phe Leu Val Met Trp Leu Ile Ser
        35                  40                  45
Ile Ser Ser Pro Lys Glu Leu Ile Gln Ile Ala Glu Tyr Phe Arg Thr
    50                  55                  60
Pro Leu Ala Thr Ala Val Thr Gly Gly Asp Arg Ile Ser Asn Ser Glu
65                  70                  75                  80
Ser Pro Ile Pro Gly Gly Gly Asp Asp Tyr Thr Gln Ser Gln Gly Glu
                85                  90                  95
Val Asn Lys Gln Pro Asn Ile Glu Glu Leu Lys Lys Arg Met Glu Gln
            100                 105                 110
Ser Arg Leu Arg Lys Leu Arg Gly Asp Leu Asp Gln Leu Ile Glu Ser
        115                 120                 125
Asp Pro Lys Leu Arg Ala Leu Arg Pro His Leu Lys Ile Asp Leu Val
    130                 135                 140
Gln Glu Gly Leu Arg Ile Gln Ile Ile Asp Ser Gln Asn Arg Pro Met
145                 150                 155                 160
Phe Arg Thr Gly Ser Ala Asp Val Glu Pro Tyr Met Arg Asp Ile Leu
                165                 170                 175
Arg Ala Ile Ala Pro Val Leu Asn Gly Ile Pro Asn Arg Ile Ser Leu
            180                 185                 190
Ser Gly His Thr Asp Asp Phe Pro Tyr Ala Ser Gly Glu Lys Gly Tyr
        195                 200                 205
Ser Asn Trp Glu Leu Ser Ala Asp Arg Ala Asn Ala Ser Arg Arg Glu
    210                 215                 220
Leu Met Val Gly Gly Leu Asp Ser Gly Lys Val Leu Arg Val Val Gly
225                 230                 235                 240
Met Ala Ala Thr Met Arg Leu Ser Asp Arg Gly Pro Asp Asp Ala Val
                245                 250                 255
Asn Arg Arg Ile Ser Leu Leu Val Leu Asn Lys Gln Ala Glu Gln Ala
            260                 265                 270
Ile Leu His Glu Asn Ala Glu Ser Gln Asn Glu Pro Val Ser Ala Leu
        275                 280                 285
Glu Lys Pro Glu Val Ala Pro Gln Val Ser Val Pro Thr Met Pro Ser
    290                 295                 300
Ala Glu Pro Arg
305
```

<210> 38
<211> 245
<212> PRT
<213> Escherichia coli

<400> 38

```
Met Arg Arg Leu Leu Ser Val Ala Pro Val Leu Leu Trp Leu Ile Thr
 1               5                  10                  15
Pro Leu Ala Phe Ala Gln Leu Pro Gly Ile Thr Ser Gln Pro Leu Pro
            20                  25                  30
Gly Gly Gly Gln Ser Trp Ser Leu Pro Val Gln Thr Leu Val Phe Ile
        35                  40                  45
Thr Ser Leu Thr Phe Ile Pro Ala Ile Leu Leu Met Met Thr Ser Phe
    50                  55                  60
Thr Arg Ile Ile Ile Val Phe Gly Leu Leu Arg Asn Ala Leu Gly Thr
65                  70                  75                  80
Pro Ser Ala Pro Pro Asn Gln Val Leu Leu Gly Leu Ala Leu Phe Leu
                85                  90                  95
Thr Phe Phe Ile Met Ser Pro Val Ile Asp Lys Ile Tyr Val Asp Ala
            100                 105                 110
Tyr Gln Pro Phe Ser Glu Glu Lys Ile Ser Met Gln Glu Ala Leu Glu
        115                 120                 125
Lys Gly Ala Gln Pro Leu Arg Glu Phe Met Leu Arg Gln Thr Arg Glu
    130                 135                 140
Ala Asp Leu Gly Leu Phe Ala Arg Leu Ala Asn Thr Gly Pro Leu Gln
145                 150                 155                 160
Gly Pro Glu Ala Val Pro Met Arg Ile Leu Leu Pro Ala Tyr Val Thr
                165                 170                 175
Ser Glu Leu Lys Thr Ala Phe Gln Ile Gly Phe Thr Ile Phe Ile Pro
            180                 185                 190
Phe Leu Ile Ile Asp Leu Val Ile Ala Ser Val Leu Met Ala Leu Gly
        195                 200                 205
Met Met Met Val Pro Pro Ala Thr Ile Ala Leu Pro Phe Lys Leu Met
    210                 215                 220
Leu Phe Val Leu Val Asp Gly Trp Gln Leu Leu Val Gly Ser Leu Ala
225                 230                 235                 240
Gln Ser Phe Tyr Ser
                245
```

<210> 39
<211> 375
<212> PRT
<213> Escherichia coli

<400> 39

```
Met Ile Arg Leu Ala Pro Leu Ile Thr Ala Asp Val Asp Thr Thr Thr
 1               5                  10                  15
Leu Pro Gly Gly Lys Ala Ser Asp Ala Ala Gln Asp Phe Leu Ala Leu
            20                  25                  30
Leu Ser Glu Ala Leu Ala Gly Glu Thr Thr Thr Asp Lys Ala Ala Pro
        35                  40                  45
Gln Leu Leu Val Ala Thr Asp Lys Pro Thr Thr Lys Gly Glu Pro Leu
    50                  55                  60
Ile Ser Asp Ile Val Ser Asp Ala Gln Gln Ala Asn Leu Leu Ile Pro
65                  70                  75                  80
```

```
Val Asp Glu Thr Pro Pro Val Ile Asn Asp Glu Gln Ser Thr Ser Thr
                85                  90                  95
Pro Leu Thr Thr Ala Gln Thr Met Ala Leu Ala Ala Val Ala Asp Lys
            100                 105                 110
Asn Thr Thr Lys Asp Glu Lys Ala Asp Asp Leu Asn Glu Asp Val Thr
        115                 120                 125
Ala Ser Leu Ser Ala Leu Phe Ala Met Leu Pro Gly Phe Asp Asn Thr
    130                 135                 140
Pro Lys Val Thr Asp Ala Pro Ser Thr Val Leu Pro Thr Glu Lys Pro
145                 150                 155                 160
Thr Leu Phe Thr Lys Leu Thr Ser Glu Gln Leu Thr Thr Ala Gln Pro
                165                 170                 175
Asp Asp Ala Pro Gly Thr Pro Ala Gln Pro Leu Thr Pro Leu Val Ala
            180                 185                 190
Glu Ala Gln Ser Lys Ala Glu Val Ile Ser Thr Pro Ser Pro Val Thr
        195                 200                 205
Ala Ala Ala Ser Pro Leu Ile Thr Pro His Gln Thr Gln Pro Leu Pro
    210                 215                 220
Thr Val Ala Ala Pro Val Leu Ser Ala Pro Leu Gly Ser His Glu Trp
225                 230                 235                 240
Gln Gln Ser Leu Ser Gln His Ile Ser Leu Phe Thr Arg Gln Gly Gln
                245                 250                 255
Gln Ser Ala Glu Leu Arg Leu His Pro Gln Asp Leu Gly Glu Val Gln
            260                 265                 270
Ile Ser Leu Lys Val Asp Asp Asn Gln Ala Gln Ile Gln Met Val Ser
        275                 280                 285
Pro His Gln His Val Arg Ala Ala Leu Glu Ala Ala Leu Pro Val Leu
    290                 295                 300
Arg Thr Gln Leu Ala Glu Ser Gly Ile Gln Leu Gly Gln Ser Asn Ile
305                 310                 315                 320
Ser Gly Glu Ser Phe Ser Gly Gln Gln Gln Ala Ala Ser Gln Gln Gln
                325                 330                 335
Gln Ser Gln Arg Thr Ala Asn His Glu Pro Leu Ala Gly Glu Asp Asp
            340                 345                 350
Asp Thr Leu Pro Val Pro Val Ser Leu Gln Gly Arg Val Thr Gly Asn
        355                 360                 365
Ser Gly Val Asp Ile Phe Ala
    370                 375

      <210> 40
      <211> 547
      <212> PRT
      <213> Escherichia coli

      <400> 40
Met Ser Ser Leu Ile Asn Asn Ala Met Ser Gly Leu Asn Ala Ala Gln
 1               5                  10                  15
Ala Ala Leu Asn Thr Ala Ser Asn Asn Ile Ser Ser Tyr Asn Val Ala
            20                  25                  30
Gly Tyr Thr Arg Gln Thr Thr Ile Met Ala Gln Ala Asn Ser Thr Leu
        35                  40                  45
Gly Ala Gly Gly Trp Val Gly Asn Gly Val Tyr Val Ser Gly Val Gln
    50                  55                  60
Arg Glu Tyr Asp Ala Phe Ile Thr Asn Gln Leu Arg Ala Ala Gln Thr
65                  70                  75                  80
```

Gln Ser Ser Gly Leu Thr Ala Arg Tyr Glu Gln Met Ser Lys Ile Asp
85 90 95
Asn Met Leu Ser Thr Ser Thr Ser Ser Leu Ala Thr Gln Met Gln Asp
100 105 110
Phe Phe Thr Ser Leu Gln Thr Leu Val Ser Asn Ala Glu Asp Pro Ala
115 120 125
Ala Arg Gln Ala Leu Ile Gly Lys Ser Glu Gly Leu Val Asn Gln Phe
130 135 140
Lys Thr Thr Asp Gln Tyr Leu Arg Asp Gln Asp Lys Gln Val Asn Ile
145 150 155 160
Ala Ile Gly Ala Ser Val Asp Gln Ile Asn Asn Tyr Ala Lys Gln Ile
165 170 175
Ala Ser Leu Asn Asp Gln Ile Ser Arg Leu Thr Gly Val Gly Ala Gly
180 185 190
Ala Ser Pro Asn Asn Leu Leu Asp Gln Arg Asp Gln Leu Val Ser Glu
195 200 205
Leu Asn Gln Ile Val Gly Val Glu Val Ser Val Gln Asp Gly Gly Thr
210 215 220
Tyr Asn Ile Thr Met Ala Asn Gly Tyr Ser Leu Val Gln Gly Ser Thr
225 230 235 240
Ala Arg Gln Leu Ala Ala Val Pro Ser Ser Ala Asp Pro Ser Arg Thr
245 250 255
Thr Val Ala Tyr Val Asp Gly Thr Ala Gly Asn Ile Glu Ile Pro Glu
260 265 270
Lys Leu Leu Asn Thr Gly Ser Leu Gly Gly Ile Leu Thr Phe Arg Ser
275 280 285
Gln Asp Leu Asp Gln Thr Arg Asn Thr Leu Gly Gln Leu Ala Leu Ala
290 295 300
Phe Ala Glu Ala Phe Asn Thr Gln His Lys Ala Gly Phe Asp Ala Asn
305 310 315 320
Gly Asp Ala Gly Glu Asp Phe Phe Ala Ile Gly Lys Pro Ala Val Leu
325 330 335
Gln Asn Thr Lys Asn Lys Gly Asp Val Ala Ile Gly Ala Thr Val Thr
340 345 350
Asp Ala Ser Ala Val Leu Ala Thr Asp Tyr Lys Ile Ser Phe Asp Asn
355 360 365
Asn Gln Trp Gln Val Thr Arg Leu Ala Ser Asn Thr Thr Phe Thr Val
370 375 380
Thr Pro Asp Ala Asn Gly Lys Val Ala Phe Asp Gly Leu Glu Leu Thr
385 390 395 400
Phe Thr Gly Thr Pro Ala Val Asn Asp Ser Phe Thr Leu Lys Pro Val
405 410 415
Ser Asp Ala Ile Val Asn Met Asp Val Leu Ile Thr Asp Glu Ala Lys
420 425 430
Ile Ala Met Ala Ser Glu Glu Asp Ala Gly Asp Ser Asp Asn Arg Asn
435 440 445
Gly Gln Ala Leu Leu Asp Leu Gln Ser Asn Ser Lys Thr Val Gly Gly
450 455 460
Ala Lys Ser Phe Asn Asp Ala Tyr Ala Ser Leu Val Ser Asp Ile Gly
465 470 475 480
Asn Lys Thr Ala Thr Leu Lys Thr Ser Ser Ala Thr Gln Gly Asn Val
485 490 495
Val Thr Gln Leu Ser Asn Gln Gln Gln Ser Ile Ser Gly Val Asn Leu
500 505 510
Asp Glu Glu Tyr Gly Asn Leu Gln Arg Phe Gln Gln Tyr Tyr Leu Ala

515 520 525
Asn Ala Gln Val Leu Gln Thr Ala Asn Ala Ile Phe Asp Ala Leu Ile
530 535 540
Asn Ile Arg
545

<210> 41
<211> 566
<212> PRT
<213> Psuedomonas aeruginosa

<400> 41
Met Asn Asp Ser Ile Gln Leu Ser Gly Leu Ser Arg Gln Leu Val Gln
1 5 10 15
Ala Asn Leu Leu Asp Glu Lys Thr Ala Leu Gln Ala Gln Thr Gln Ala
20 25 30
Gln Arg Asn Lys Leu Ser Leu Val Thr His Leu Val Gln Asn Lys Leu
35 40 45
Val Ser Gly Leu Ala Leu Ala Glu Leu Ser Ala Glu Gln Phe Gly Ile
50 55 60
Ala Tyr Cys Asp Leu Asn Ser Leu Asp Arg Glu Ser Phe Pro Arg Asp
65 70 75 80
Ala Ile Ser Glu Lys Leu Val Arg Gln His Arg Val Ile Pro Leu Trp
85 90 95
Arg Arg Gly Asn Lys Leu Phe Val Gly Ile Ser Asp Ala Ala Asn His
100 105 110
Gln Ala Ile Asn Asp Val Gln Phe Ser Thr Gly Leu Thr Thr Glu Ala
115 120 125
Ile Leu Val Glu Asp Asp Lys Leu Gly Leu Ala Ile Asp Lys Leu Phe
130 135 140
Glu Asn Ala Thr Asp Gly Leu Ala Gly Leu Asp Asp Val Asp Leu Glu
145 150 155 160
Gly Leu Asp Val Gly Val Lys Glu Thr Ser Gly Gln Glu Asp Thr Gly
165 170 175
Ala Glu Ala Asp Asp Ala Pro Val Val Arg Phe Val Asn Lys Met Leu
180 185 190
Leu Asp Ala Ile Lys Gly Gly Ser Ser Asp Leu His Phe Glu Pro Tyr
195 200 205
Glu Lys Ile Tyr Arg Val Arg Phe Arg Thr Asp Gly Met Leu His Glu
210 215 220
Val Ala Lys Pro Pro Ile Gln Leu Ala Ser Arg Ile Ser Ala Arg Leu
225 230 235 240
Lys Val Met Ala Gly Leu Asp Ile Ser Glu Arg Arg Lys Pro Gln Asp
245 250 255
Gly Arg Ile Lys Met Arg Val Ser Lys Thr Lys Ser Ile Asp Phe Arg
260 265 270
Val Asn Thr Leu Pro Thr Leu Trp Gly Glu Lys Ile Val Met Arg Ile
275 280 285
Leu Asp Ser Ser Ser Ala Gln Met Gly Ile Asp Ala Leu Gly Tyr Glu
290 295 300
Glu Asp Gln Lys Glu Leu Tyr Leu Ala Ala Leu Lys Gln Pro Gln Gly
305 310 315 320
Met Ile Leu Val Thr Gly Pro Thr Gly Ser Gly Lys Thr Val Ser Leu
325 330 335
Tyr Thr Gly Leu Asn Ile Leu Asn Thr Thr Asp Ile Asn Ile Ser Thr

```
                340                 345                 350
Ala Glu Asp Pro Val Glu Ile Asn Leu Glu Gly Ile Asn Gln Val Asn
        355                 360                 365
Val Asn Pro Arg Gln Gly Met Asp Phe Ser Gln Ala Leu Arg Ala Phe
    370                 375                 380
Leu Arg Gln Asp Pro Asp Val Ile Met Val Gly Glu Ile Arg Asp Leu
385                 390                 395                 400
Glu Thr Ala Glu Ile Ala Ile Lys Ala Ala Gln Thr Gly His Met Val
                405                 410                 415
Met Ser Thr Leu His Thr Asn Ser Ala Ala Glu Thr Leu Thr Arg Leu
            420                 425                 430
Leu Asn Met Gly Val Pro Ala Phe Asn Leu Ala Thr Ser Val Asn Leu
        435                 440                 445
Ile Ile Ala Gln Arg Leu Ala Arg Lys Leu Cys Ser His Cys Lys Lys
    450                 455                 460
Glu His Asp Val Pro Lys Glu Thr Leu Leu His Glu Gly Phe Pro Glu
465                 470                 475                 480
Glu Leu Ile Gly Thr Phe Lys Leu Tyr Ser Pro Val Gly Cys Asp His
                485                 490                 495
Cys Lys Asn Gly Tyr Lys Gly Arg Val Gly Ile Tyr Glu Val Val Lys
            500                 505                 510
Asn Thr Pro Ala Leu Gln Arg Ile Ile Met Glu Glu Gly Asn Ser Ile
        515                 520                 525
Glu Ile Ala Glu Gln Ala Arg Lys Glu Gly Phe Asn Asp Leu Arg Thr
    530                 535                 540
Ser Gly Leu Leu Lys Ala Met Gln Gly Ile Thr Ser Leu Glu Glu Val
545                 550                 555                 560
Asn Arg Val Thr Lys Asp
                565
```

<210> 42
<211> 406
<212> PRT
<213> Psuedomonas aeruginosa

<400> 42

```
Met Ala Asp Lys Ala Leu Lys Thr Ser Val Phe Ile Trp Glu Gly Thr
 1               5                  10                  15
Asp Lys Lys Gly Ala Lys Val Lys Gly Glu Leu Thr Gly Gln Asn Pro
            20                  25                  30
Met Leu Val Lys Ala His Leu Arg Lys Gln Gly Ile Asn Pro Leu Lys
        35                  40                  45
Val Arg Lys Lys Gly Ile Ser Leu Leu Gly Ala Gly Lys Lys Val Lys
    50                  55                  60
Pro Met Asp Ile Ala Leu Phe Thr Arg Gln Met Ala Thr Met Met Gly
65                  70                  75                  80
Ala Gly Val Pro Leu Leu Gln Ser Phe Asp Ile Ile Gly Glu Gly Phe
                85                  90                  95
Asp Asn Pro Asn Met Arg Lys Leu Val Asp Glu Ile Lys Gln Glu Val
            100                 105                 110
Ser Ser Gly Asn Ser Leu Ala Asn Ser Leu Arg Lys Lys Pro Gln Tyr
        115                 120                 125
Phe Asp Glu Leu Tyr Cys Asn Leu Val Asp Ala Gly Glu Gln Ser Gly
    130                 135                 140
Ala Leu Glu Asn Leu Leu Asp Arg Val Ala Thr Tyr Lys Glu Lys Thr
```

```
145                 150                 155                 160
Glu Ser Leu Lys Ala Lys Ile Lys Lys Ala Met Thr Tyr Pro Ile Ala
                165                 170                 175
Val Ile Ile Val Ala Leu Ile Val Ser Ala Ile Leu Leu Ile Lys Val
            180                 185                 190
Val Pro Gln Phe Gln Ser Val Phe Glu Gly Phe Gly Ala Glu Leu Pro
        195                 200                 205
Ala Phe Thr Gln Met Ile Val Asn Leu Ser Glu Phe Met Gln Glu Trp
    210                 215                 220
Trp Phe Phe Ile Ile Leu Ala Ile Ala Ile Phe Gly Phe Ala Phe Lys
225                 230                 235                 240
Glu Leu His Lys Arg Ser Gln Lys Phe Arg Asp Thr Leu Asp Arg Thr
                245                 250                 255
Ile Leu Lys Leu Pro Ile Phe Gly Gly Ile Val Tyr Lys Ser Ala Val
            260                 265                 270
Ala Arg Tyr Ala Arg Thr Leu Ser Thr Thr Phe Ala Ala Gly Val Pro
        275                 280                 285
Leu Val Asp Ala Leu Asp Ser Val Ser Gly Ala Thr Gly Asn Ile Val
    290                 295                 300
Phe Lys Asn Ala Val Ser Lys Ile Lys Gln Asp Val Ser Thr Gly Met
305                 310                 315                 320
Gln Leu Asn Phe Ser Met Arg Thr Thr Ser Val Phe Pro Asn Met Ala
                325                 330                 335
Ile Gln Met Thr Ala Ile Gly Glu Glu Ser Gly Ser Leu Asp Glu Met
            340                 345                 350
Leu Ser Lys Val Ala Ser Tyr Tyr Glu Glu Glu Val Asp Asn Ala Val
        355                 360                 365
Asp Asn Leu Thr Thr Leu Met Glu Pro Met Ile Met Ala Val Leu Gly
    370                 375                 380
Val Leu Val Gly Gly Leu Ile Val Ala Met Tyr Leu Pro Ile Phe Gln
385                 390                 395                 400
Leu Gly Asn Val Val Gly
                405
```

<210> 43
<211> 290
<212> PRT
<213> Psuedomonas aeruginosa

<400> 43

```
Met Pro Leu Leu Asp Tyr Leu Ala Ser His Pro Leu Ala Phe Val Leu
 1                5                  10                  15
Cys Ala Ile Leu Leu Gly Leu Leu Val Gly Ser Phe Leu Asn Val Val
            20                  25                  30
Val His Arg Leu Pro Lys Met Met Glu Arg Asn Trp Lys Ala Glu Ala
        35                  40                  45
Arg Glu Ala Leu Gly Leu Glu Pro Glu Pro Lys Gln Ala Thr Tyr Asn
    50                  55                  60
Leu Val Leu Pro Asn Ser Ala Cys Pro Arg Cys Gly His Glu Ile Arg
65                  70                  75                  80
Pro Trp Glu Asn Ile Pro Leu Val Ser Tyr Leu Ala Leu Gly Gly Lys
                85                  90                  95
Cys Ser Ser Cys Lys Ala Ala Ile Gly Lys Arg Tyr Pro Leu Val Glu
            100                 105                 110
Leu Ala Thr Ala Leu Leu Ser Gly Tyr Val Ala Trp His Phe Gly Phe
```

```
        115                 120                 125
Thr Trp Gln Ala Gly Ala Met Leu Leu Leu Thr Trp Gly Leu Leu Ala
    130                 135                 140
Met Ser Leu Ile Asp Ala Asp His Gln Leu Leu Pro Asp Val Leu Val
145                 150                 155                 160
Leu Pro Leu Leu Trp Leu Gly Leu Ile Ala Asn His Phe Gly Leu Phe
                165                 170                 175
Ala Ser Leu Asp Asp Ala Leu Phe Gly Ala Val Phe Gly Tyr Leu Ser
            180                 185                 190
Leu Trp Ser Val Phe Trp Leu Phe Lys Leu Val Thr Gly Lys Glu Gly
        195                 200                 205
Met Gly Tyr Gly Asp Phe Lys Leu Leu Ala Met Leu Gly Ala Trp Gly
    210                 215                 220
Gly Trp Gln Ile Leu Pro Leu Thr Ile Leu Leu Ser Ser Leu Val Gly
225                 230                 235                 240
Ala Ile Leu Gly Val Ile Met Leu Arg Leu Arg Asn Ala Glu Ser Gly
                245                 250                 255
Thr Pro Ile Pro Phe Gly Pro Tyr Leu Ala Ile Ala Gly Trp Ile Ala
            260                 265                 270
Leu Leu Trp Gly Asp Gln Ile Thr Arg Thr Tyr Leu Gln Phe Ala Gly
        275                 280                 285
Phe Lys
    290
```

<210> 44
<211> 185
<212> PRT
<213> Psuedomonas aeruginosa

<400> 44

```
Met Leu Leu Lys Ser Arg His Arg Ser Leu His Gln Ser Gly Phe Ser
 1               5                  10                  15
Met Ile Glu Val Leu Val Ala Leu Leu Leu Ile Ser Ile Gly Val Leu
            20                  25                  30
Gly Met Ile Ala Met Gln Gly Lys Thr Ile Gln Tyr Thr Ala Asp Ser
        35                  40                  45
Val Glu Arg Asn Lys Ala Ala Met Leu Gly Ser Asn Leu Leu Glu Ser
    50                  55                  60
Met Arg Ala Ser Pro Lys Ala Leu Tyr Asp Val Lys Asp Gln Met Ala
65                  70                  75                  80
Thr Gln Ser Asp Phe Phe Lys Ala Lys Gly Ser Ala Phe Pro Thr Ala
                85                  90                  95
Pro Ser Ser Cys Thr Pro Leu Pro Asp Ala Ile Lys Asp Arg Leu Gly
            100                 105                 110
Cys Trp Ala Glu Gln Val Lys Asn Glu Leu Pro Gly Ala Gly Asp Leu
        115                 120                 125
Leu Lys Ser Asp Tyr Tyr Ile Cys Arg Ser Ser Lys Pro Gly Asp Cys
    130                 135                 140
Asp Gly Lys Gly Ser Met Leu Glu Ile Arg Leu Ala Trp Arg Gly Lys
145                 150                 155                 160
Gln Gly Ala Cys Val Asn Ala Ala Asp Ser Ser Ala Asp Thr Ser Leu
                165                 170                 175
Cys Tyr Tyr Thr Leu Arg Val Glu Pro
            180                 185
```

<210> 45
<211> 274
<212> PRT
<213> Psuedomonas aeruginosa

<400> 45

```
Met Ser Met Asn Asn Arg Ser Arg Arg Gln Ser Gly Leu Ser Met Ile
 1               5                  10                  15
Glu Leu Leu Val Ala Leu Ala Ile Ser Ser Phe Leu Ile Leu Gly Ile
            20                  25                  30
Thr Gln Ile Tyr Leu Asp Asn Lys Arg Asn Tyr Leu Phe Gln Gln Gly
        35                  40                  45
Gln Ala Gly Asn Gln Glu Asn Gly Arg Phe Ala Met Met Phe Leu Asp
    50                  55                  60
Gln Gln Leu Ala Lys Val Gly Phe Arg Arg Arg Ala Asp Asp Pro Asn
65                  70                  75                  80
Glu Phe Ala Phe Pro Ala Gln Gln Lys Thr Ala Tyr Cys Glu Ala Phe
                85                  90                  95
Lys Ala Gly Ser Thr Leu Val Pro Ala Val Val Lys Ala Gly Gln Ser
            100                 105                 110
Gly Phe Cys Tyr Arg Tyr Gln Pro Ala Pro Gly Glu Ala Tyr Asp Cys
        115                 120                 125
Glu Gly Asn Ser Ile Thr Thr Pro Ser Asp Pro Phe Ala Thr Ala Gln
    130                 135                 140
Ala Ile Thr Ala Arg Val Leu Phe Val Pro Ala Thr Ala Asp Val Pro
145                 150                 155                 160
Gly Ser Leu Ala Cys Ser Ala Gln Thr Ile Lys Glu Lys Gly Gln Glu
                165                 170                 175
Ile Val Ser Gly Leu Val Asp Phe Lys Leu Glu Tyr Gly Val Gly Pro
            180                 185                 190
Thr Met Ala Gly Lys Arg Glu Val Glu Ser Phe Val Glu Gln Ala Asn
        195                 200                 205
Ile Ala Asp Arg Pro Val Arg Ala Leu Arg Tyr Ser Ala Leu Met Ala
    210                 215                 220
Ser Asp Lys Asn Leu Arg Gln Gly Asp Ser Lys Thr Leu Asp Asp Trp
225                 230                 235                 240
Ile Thr Leu Tyr Pro Ser Ser Lys Thr Ser Leu Gln Gly Asn Asp Lys
                245                 250                 255
Asp Arg Leu Tyr Gln Ile Ala Lys Gly Ser Gln Thr Leu Arg Asn Leu
            260                 265                 270
Val Pro
```

<210> 46
<211> 172
<212> PRT
<213> Psuedomonas aeruginosa

<400> 46

```
Met Asn Asn Phe Pro Ala Gln Gln Arg Gly Ala Thr Leu Val Ile Ala
 1               5                  10                  15
Leu Ala Ile Leu Val Ile Val Thr Leu Leu Ala Val Ser Ser Met Arg
            20                  25                  30
Glu Val Val Leu Glu Ser Arg Ile Thr Gly Asn Val Ile Glu Gln Thr
        35                  40                  45
```

```
Arg Leu Gln Asn Ala Ala Glu Ser Gly Leu Arg Glu Gly Glu Arg Arg
    50                  55                  60
Phe Val Asn Thr Leu Arg Pro Pro Glu Pro Gly Thr Gly Cys Thr Ala
65                  70                  75                  80
Asp Asn Val Ala Arg Pro Cys Leu Leu Asp Leu Ala Ala Leu Asn Leu
                85                  90                  95
Lys Leu Ala Asp Thr His Gln Asn Pro Val Gly Val Leu Lys Gly Ile
            100                 105                 110
Ala Asn Thr Trp Met Ser Tyr Arg Gly Ser Asp Ile Ser Ser Ala Thr
        115                 120                 125
Thr Ala Gly Asn Ala Leu Gln Arg Ala Val Glu Gln Pro Ala His Ser
    130                 135                 140
Leu Gly Arg Pro Gly Gln Arg Ser Gly Lys Pro Arg Ile Arg Gln Pro
145                 150                 155                 160
Asp Ala Arg His Arg His Leu Leu Leu Arg Asp Gln
                165                 170
```

<210> 47
<211> 1161
<212> PRT
<213> Psuedomonas aeruginosa

<400> 47

```
Met Arg Gly Ile Gly Thr Phe Tyr Tyr Glu Thr Asn Ser Val Ala Arg
 1                  5                  10                  15
Asn Gln Thr Asn Ser Glu Thr Val Leu Gln Thr Val Ala Arg Pro Ser
            20                  25                  30
Leu Tyr Gln Leu Ile Glu Pro Arg Met Lys Ser Val Leu His Gln Ile
        35                  40                  45
Gly Lys Thr Ser Leu Ala Ala Ala Leu Ser Gly Ala Val Leu Leu Ser
    50                  55                  60
Ala Gln Thr Thr His Ala Ala Ala Leu Ser Val Ser Gln Gln Pro Leu
65                  70                  75                  80
Met Leu Ile Gln Gly Val Ala Pro Asn Met Leu Val Thr Leu Asp Asp
                85                  90                  95
Ser Gly Ser Met Ala Phe Ala Tyr Ala Pro Asp Ser Ile Ser Gly Tyr
            100                 105                 110
Gly Asn Tyr Thr Phe Phe Ala Ser Asn Ser Phe Asn Pro Met Tyr Phe
        115                 120                 125
Asp Pro Asn Thr Gln Tyr Lys Leu Pro Lys Lys Leu Thr Leu Val Asn
    130                 135                 140
Gly Gln Val Gln Ile Gln Asp Tyr Pro Ala Pro Asn Phe Ser Ser Ala
145                 150                 155                 160
Trp Arg Asn Gly Phe Thr Arg Arg Gly Ser Ile Asn Leu Ser Asn Ser
                165                 170                 175
Tyr Lys Val Thr Ile Glu Tyr Gly Arg Gly Tyr Asp Lys Glu Ser Thr
            180                 185                 190
Ile Lys Ala Asp Ala Ala Tyr Tyr Tyr Asp Phe Thr Gly Ser Ser Ser
        195                 200                 205
Trp Asn Arg Thr Asn Gln Ala Cys Tyr Thr Arg Arg Tyr Val Ser Thr
    210                 215                 220
Glu Gln Arg Gln Asn Phe Ala Asn Trp Tyr Ser Phe Tyr Arg Thr Arg
225                 230                 235                 240
Ala Leu Arg Thr Gln Thr Ala Ala Asn Leu Ala Phe Phe Arg Leu Pro
                245                 250                 255
```

```
Glu Asn Ala Arg Val Ser Trp Gln Leu Leu Asn Asp Ser Asn Cys Asn
            260                 265                 270
Gln Met Gly Ser Gly Ser Arg Leu Arg Gln Leu Phe Gln Gln Leu Ser
        275                 280                 285
Thr Gly Leu His Arg Ser Thr Ala Gly Glu Leu Leu Gln Leu Ala Gly
    290                 295                 300
Lys Thr Phe Gly Gln Trp Trp Tyr Ala Leu Arg Gln Ala Met Thr Arg
305                 310                 315                 320
Glu Ala Ser Phe Ser Arg Arg Pro Ala Ser Asn Gly Pro Tyr Ala Tyr
                325                 330                 335
Arg Pro Gly Thr Gln Thr Ala Pro Glu Tyr Ser Cys Arg Gly Ser Tyr
            340                 345                 350
His Ile Leu Met Thr Asp Gly Leu Trp Asn Asn Asp Ser Ala Asn Val
        355                 360                 365
Gly Asn Ala Asp Ser Thr Ala Arg Asn Leu Pro Asp Gly Lys Ser Tyr
    370                 375                 380
Ser Ser Gln Thr Pro Tyr Arg Asp Gly Thr Phe Asp Thr Leu Ala Asp
385                 390                 395                 400
Gln Ala Phe His Tyr Trp Ala Thr Asp Ala Arg Pro Asp Ile Asp Asp
                405                 410                 415
Asn Ile Lys Pro Tyr Ile Pro Tyr Pro Asp Gln Asp Asn Pro Ser Gly
            420                 425                 430
Glu Tyr Trp Asn Pro Arg Asn Asp Pro Ala Ile Trp Gln His Met Val
        435                 440                 445
Thr Tyr Thr Leu Gly Leu Gly Leu Asn Thr Ser Leu Thr Ser Pro Arg
    450                 455                 460
Trp Glu Gly Ser Thr Phe Ser Gly Gly Tyr Asn Asp Ile Val Ala Gly
465                 470                 475                 480
Asn Leu Ser Trp Pro Arg Ala Ser Asn Asn Asp Ser Asn Asn Val Tyr
                485                 490                 495
Asp Leu Trp His Ala Ala Val Asn Ser Arg Gly Glu Phe Phe Ser Ala
            500                 505                 510
Asp Ser Pro Asp Gln Leu Val Ala Ala Phe Gln Asp Ile Leu Asn Arg
        515                 520                 525
Ile Ser Gly Lys Asp Leu Pro Ala Ser Arg Pro Ala Ile Ser Ser Ser
    530                 535                 540
Leu Gln Glu Asp Asp Thr Gly Asp Lys Leu Thr Arg Phe Ala Tyr Gln
545                 550                 555                 560
Thr Ser Phe Ala Ser Asp Lys Asn Trp Ala Gly Asp Leu Thr Arg Tyr
                565                 570                 575
Ser Leu Thr Thr Gln Asp Lys Ala Thr Val Gln Thr Asn Leu Trp Ser
            580                 585                 590
Ala Gln Ser Ile Leu Asp Ala Met Pro Asn Gly Gly Ala Gly Arg Lys
        595                 600                 605
Ile Met Met Ala Gly Ser Gly Thr Ser Gly Leu Lys Glu Phe Thr Trp
    610                 615                 620
Gly Ser Leu Ser Ala Asp Gln Gln Arg Lys Leu Asn Arg Asp Pro Asp
625                 630                 635                 640
Arg Asn Asp Val Ala Asp Thr Lys Gly Gln Asp Arg Val Ala Phe Leu
                645                 650                 655
Arg Gly Asp Arg Arg Lys Glu Asn Ser Asp Asn Phe Arg Thr Arg Asn
            660                 665                 670
Ser Ile Leu Gly Asp Ile Ile Asn Ser Ser Pro Ala Thr Val Gly Lys
        675                 680                 685
Ala Gln Tyr Leu Thr Tyr Leu Ala Gln Pro Ile Glu Pro Ser Gly Asn
```

690 695 700
Tyr Ser Thr Phe Ala Glu Ala Gln Lys Thr Arg Ala Pro Arg Val Tyr
705 710 715 720
Val Gly Ala Asn Asp Gly Met Leu His Gly Phe Asp Thr Asp Gly Asn
725 730 735
Glu Thr Phe Ala Phe Ile Pro Ser Ala Val Phe Glu Lys Leu His Lys
740 745 750
Leu Thr Ala Arg Gly Tyr Gln Gly Gly Ala His Gln Phe Tyr Val Asp
755 760 765
Gly Ser Pro Val Val Ala Asp Ala Phe Phe Gly Gly Ala Trp His Thr
770 775 780
Val Leu Ile Gly Ser Leu Arg Ala Gly Gly Lys Gly Leu Phe Ala Leu
785 790 795 800
Asp Val Thr Asp Pro Ala Asn Ile Lys Leu Leu Trp Glu Ile Gly Val
805 810 815
Asp Gln Glu Pro Asp Leu Gly Tyr Ser Phe Pro Lys Pro Thr Val Ala
820 825 830
Arg Leu His Asn Gly Lys Trp Ala Val Val Thr Gly Asn Gly Tyr Ser
835 840 845
Ser Leu Asn Asp Lys Ala Ala Leu Leu Ile Ile Asp Leu Glu Thr Gly
850 855 860
Ala Ile Thr Arg Lys Leu Glu Val Thr Gly Arg Thr Gly Val Pro Asn
865 870 875 880
Gly Leu Ser Ser Leu Arg Leu Ala Asp Asn Asn Ser Asp Gly Val Ala
885 890 895
Asp Tyr Ala Tyr Ala Gly Asp Leu Gln Gly Asn Leu Trp Arg Phe Asp
900 905 910
Leu Ile Ala Gly Lys Val Asn Gln Asp Asp Pro Phe Ser Arg Ala Asn
915 920 925
Asp Gly Pro Thr Val Ala Ser Ser Phe Arg Val Ser Phe Gly Gly Gln
930 935 940
Pro Leu Tyr Ser Ala Val Asp Ser Ala Gly Ala Ala Gln Ala Ile Thr
945 950 955 960
Ala Ala Pro Ser Leu Val Arg His Pro Thr Arg Lys Gly Tyr Ile Val
965 970 975
Ile Phe Gly Thr Gly Lys Tyr Phe Glu Asn Ala Asp Ala Arg Ala Asp
980 985 990
Thr Ser Arg Ala Gln Thr Leu Tyr Gly Ile Trp Asp Gln Gln Thr Lys
995 1000 1005
Gly Glu Ala Ala Gly Ser Thr Pro Arg Leu Thr Arg Gly Asn Leu Gln
1010 1015 1020
Gln Gln Thr Leu Asp Leu Gln Ala Asp Ser Thr Phe Ala Ser Thr Ala
1025 1030 1035 104
Arg Thr Ile Arg Ile Gly Ser Gln Asn Pro Val Asn Trp Leu Asn Asn
1045 1050 1055
Asp Gly Ser Thr Lys Gln Ser Gly Trp Tyr Leu Asp Phe Met Val Asn
1060 1065 1070
Gly Thr Leu Lys Gly Glu Met Leu Ile Glu Asp Met Ile Ala Ile Gly
1075 1080 1085
Gln Val Val Leu Leu Gln Thr Ile Thr Pro Asn Asp Asp Pro Cys Ala
1090 1095 1100
Asp Gly Ala Ser Asn Trp Thr Tyr Gly Leu Asp Pro Tyr Thr Gly Gly
1105 1110 1115 112
Arg Thr Arg Phe Thr Val Phe Asp Leu Gly Arg Gln Gly Val Val Gly
1125 1130 1135

```
Leu Glu Ile Arg Leu Thr Gly Thr Thr Arg Arg Asn Val Gly Asn Pro
            1140                1145                1150
Val Pro Ser Arg Lys Ala Trp Glu Ala
        1155                1160

      <210> 48
      <211> 115
      <212> PRT
      <213> Psuedomonas aeruginosa

      <400> 48
Met Lys Val Leu Pro Met Leu Leu Ala Leu Ala Val Pro Gly Leu Cys
 1               5                  10                  15
Trp Ala Glu Asp Pro Gln Thr Phe Glu Gly Ala Gly Val Val Phe Glu
            20                  25                  30
Val Gln Val Glu Lys Asn Leu Val Asp Ile Asp His Arg Leu Tyr Arg
        35                  40                  45
Leu Pro Asn Ser Thr Val Arg Asn Gly Met Pro Ser Leu Phe Gln Val
    50                  55                  60
Lys Pro Gly Ser Val Val Ser Tyr Ser Gly Thr Val Ser Gln Pro Trp
65                  70                  75                  80
Ser Thr Ile Thr Asp Ile Tyr Ile His Lys Gln Met Ser Glu Gln Glu
                85                  90                  95
Leu Ala Glu Met Ile Glu Lys Glu Gln Pro Arg Gln Asp Gly Glu Glu
            100                 105                 110
Gln Pro Arg
        115

      <210> 49
      <211> 141
      <212> PRT
      <213> Psuedomonas aeruginosa

      <400> 49
Met Arg Thr Arg Gln Lys Gly Phe Thr Leu Leu Glu Met Val Val Val
 1               5                  10                  15
Val Ala Val Ile Gly Ile Leu Leu Gly Ile Ala Ile Pro Ser Tyr Gln
            20                  25                  30
Asn Tyr Val Ile Arg Ser Asn Arg Thr Glu Gly Gln Ala Leu Leu Ser
        35                  40                  45
Asp Ala Ala Ala Arg Gln Glu Arg Tyr Tyr Ser Gln Asn Pro Gly Val
    50                  55                  60
Gly Tyr Thr Lys Asp Val Ala Lys Leu Gly Met Ser Ser Ala Asn Ser
65                  70                  75                  80
Pro Asn Asn Leu Tyr Asn Leu Thr Ile Ala Thr Pro Thr Ser Thr Thr
                85                  90                  95
Tyr Thr Leu Thr Ala Thr Pro Ile Asn Ser Gln Thr Arg Asp Lys Thr
            100                 105                 110
Cys Gly Lys Leu Thr Leu Asn Gln Leu Gly Glu Arg Gly Ala Ala Gly
        115                 120                 125
Lys Thr Gly Asn Asn Ser Thr Val Asn Asp Cys Trp Arg
    130                 135                 140
```